TECHNICAL MEMORANDUM

Gay Mine Field Oversight Technical Memorandum

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COPY TO:	File
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DATE:	8/20/2020
PROJECT NUMBER:	680372CH

This memorandum presents a summary of the observations conducted as part of the Gay Mine oversight, Task Order 95, which includes oversight of the incremental sampling methodology (ISM) soil investigation initiated in 2020 by Golder Associates (Golder). As described in the *2020 Gay Mine Soil Sampling Remedial Investigation Work Plan Addendum* (Golder, 2020), the objective of the ISM soil investigation is to characterize contaminant concentrations in soils at the surface and depth for all decision units (DUs) within the Gay Mine study area, in order to support a detailed quantitative human health and ecological risk assessment.

In August 2020, the field oversight consisted of accompanying Golder's field sampling crew, observing the incremental soil sampling, noting any anomalies in site conditions, and assessing whether the crew is following the protocols and procedures outlined in the work plan and QAPP (Golder, 2020). No split samples were collected in the field. The field oversight was conducted August 3rd through August 6th by Greg Warren, P. G., of Jacobs' Boise office [Jacobs]. On August 6th, Natalie Dowdy from Jacobs was also on site to overlap with Mr. Warren and observe site activities. The following narrative provides a summary of those activities. Site photographs are also provided at the end of the memorandum to illustrate the site observations.

Monday August 3:

- Jacobs arrived at the Shoshone-Bannock Tribal Office in Fort Hall at 0930 to sign in and meet the Golder Crew. The Golder crew included Jessica (Jess) Busey (Field Team Lead), and Matt Thomas, Tom Haskins, and Turner Dogget, the field sampling crew.
- Jacobs accompanied Golder crew to HQ area. Scott, the excavator operator, was also present to dig the soil sampling pits. Golder conducted a safety meeting, which topics included heat and staying hydrated, fire hazards, and trip/slip/falls. Golder also conducted inspections of the UTVs they were using to access the sample points and carry sampling gear.
- Golder continued to sample at DU-04-6, which they had begun the previous work day. Golder devised a system where they mark out the primary sample increments (60 per DU) with flagging using pre-loaded GPS points. The primary increment location would be marked as sample point XX-1, for example, at increment 22, 22-1. Then, they would measure 5 meters to the northeast of the primary point to locate the secondary sample, and mark it with a flag labeled 22-2, and a third point 5 meters to the southwest of the primary sample point to mark the tertiary sample, labeled 22-3.
- After the sample points were flagged, the excavator operator dug the 3 pits at each increment to approximately 1.5 feet in depth. The sampling crew would collect the incremental soil samples as follows:
    - The sampler would use a dedicated red-handled trowel to clean the pit sidewalls with from the 3"-12" depth interval and scrape the soil sample into a cup pre-marked with a line to indicate

approximately 25 grams of sample. Fine gravels were removed in the field. Each sample increment was placed into a Ziploc baggie with previous 3”-12” depth interval soil increments from that DU.

- Next, using a dedicated black-handled trowel to avoid mix-up, the sampler would scrape the 0”-3” interval clean, and then trowel the soil into a different dedicated measuring cup marked with a line to indicate approximately 50 grams of sample. Then that soil sample was poured into a labeled gallon Ziploc baggie with the soil from the previous 0”-3” depth intervals from that DU.
- At each increment location, one of the Golder crew would describe the soils on a field sampling form, with a brief description for each of the 60 increments in the DU. Afterwards, Golder would pull the flags out and move to the next sample increment and repeat the process, until all 60 increments (180 total including primary, secondary, and tertiary sample points) were sampled. By then the primary, secondary, and tertiary soils would comprise a composite sample for that DU, for a total of 6 samples: The 0”-3” primary, secondary, and tertiary samples; and the 3”-12” primary, secondary, and tertiary samples.
- The composite Sample IDs consist of the shallow/deep interval, DU name, date, and time, and primary/secondary/tertiary designation. For example, the composite samples for DU-9 (6 samples total) would be designated as:
    - **Shallow interval (0”-3”) composite sample**:
        - I-SS-OT-NL-9-080420-1 (primary location)
        - I-SS-OT-NL-9-080420-2 (secondary location)
        - I-SS-OT-NL-9-080420-3 (tertiary location)
    - **Deep interval (3”-12”) composite sample:**
        - I-DS-OT-NL-9-080420-1 (primary location)
        - I-DS-OT-NL-9-080420-2 (secondary location)
        - I-DS-OT-NL-9-080420-3 (tertiary location)
- Ideally, with a 4-person crew, Golder’s strategy would be to have each crew member sample from a “dedicated” increment location, e.g. Sampler A would sample each primary increment point, Sample B would sample each secondary point, etc., so that the primary, secondary, and tertiary composite samples were not mixed. The 4th crew member would describe the soils at each increment, and then pull the flags to indicate the sampling was complete. The excavator would then follow behind them and backfill the pits and regrade the area

- The crew continued to sample at DU-04-6 all day, and nearly finished. They planned to complete sampling DU-04-6 the following morning; and also begin locating sample points in DU-9a and DU-9b, adjacent to the HQ area.
- During the oversight, Jacobs recorded notes and observations in a dedicated field notebook, completed field forms for each DU that included the date, weather, field personnel, soil textures, general conditions of the DU, variations in soil types, etc. Jacobs also noted some observations and marked them on maps of the DUs. However, with only limited oversight being conducted, all these observations and data will not be available for each and every single DU and sampling increment.
- Jacobs, Golder, and Scott left the site approximately 1630, drove back to the SB office, and signed out.

Tuesday August 4th:

- Jacobs arrived at the Shoshone-Bannock Tribal Office at 0700 and met the Golder Crew, signed in, and drove to the Gay Mine HQ area. Golder and Jacobs and Scott participated in a safety meeting.

- Tom and Matt from Golder finished the soil sampling at DU-04-6. Jess and Turner began to locate primary, secondary, and tertiary sampling points in DU-OT-NL-9a and DU-OT-NL-9b. DU-9a was located up on a flat "bench" north of the railroad tracks and consisted of 5 increments. DU-9b was a long, narrow, east-west trending DU with 3 sets of railroad tracks running through it. Therefore, this DU was underlain by non-native soils, largely railroad ballast material that consisted of 3"- to 4"-minus angular gravels with a sand/silt matrix.
- Because DU-9b had a long, narrow shape and is bordered on the north and south by cut slopes, some of the secondary and tertiary sample increments "landed" on the cut slopes. Also, with 3 sets of RR tracks in this DU, some of the increments were dug between railroad ties.
- Jacobs, Golder, and Scott left the site approximately 1720, drove back to the SB office, and signed out.

Wednesday August 5th:

- Jacobs arrived at the Shoshone-Bannock Tribal Office in at 0630 and met the Golder Crew, signed in, and drove to the Gay Mine HQ area. Golder and Jacobs and Scott conducted a safety meeting. The Golder crew re-fueled the UTVs, and finished locating sample points and sampling DU-OT-NL-9b.
- Once Golder finished sampling DU-OT-NL-9b, they decontaminated the sampling trowels and measuring cups using Alconox and distilled water, following protocols outlined in the work plan. They collected an Equipment Blank from one of the trowels, labeled I-SS-OT-NL-9-080520-EB.
- Golder moved over to Mill Shale pile DU-A-5, and began locating the sampling points, and sampled points 1 through 40, Golder also collected duplicate samples from this DU.
- Jeff Hamilton from Simplot visited the site. Jacobs and Jeff discussed that this Mill Shale pile didn't appear to contain much shale, so may have been misinterpreted or the original information was incorrect. Also, Mr. Hamilton suggested that Jacobs accompany Golder and conduct oversight during the upcoming surface water and groundwater sampling in order to observe layout of this massive mine site, and also see the points of compliance. Jacobs agreed this would definitely assist us in reviewing work plans and data produced during the upcoming investigations.
- Jacobs, Golder, and Scott left the site approximately 1630, drove back to the SB office, and signed out.

Thursday August 6th:

- Jacobs arrived at the Shoshone-Bannock Tribal Office in at 0900 and met the Golder Crew (Golder was shipping samples that morning), signed in, and drove to the Gay Mine HQ area. Natalie Dowdy, a geologist with Jacobs who will be conducting sampling oversight, also accompanied to observe sampling protocols. Golder, Jacobs and Scott conducted a safety meeting, whose topics included primarily heat and hydration.
- Golder finished sampling DU-A-5, creating composite samples labeled I-SS/DS-MS-A-5-080520-1/2/3. The southern part of this DU was a lower-elevation swale that consisted of gray-brown, organic silt/clay with very little gravel; in contrast with the northern part of the DU, which was a higher benched area that contained more gravel with silty sand matrix to silty sand with gravel, and very little black shale.
- After completing DU-A-5, Jess and Turner collected equipment blanks from the trowels; while Tom and Matt mobilized over to DU-A-2B which is also designated as a Mill Shale pile. They began locating sample points, and Scott began excavating pits in this DU. This material appeared to be more like that expected in mill shale, and consisted primarily of broken black shale fragments with dark soil matrix. Jess and Turner appeared at this DU and began sampling.

- At 1510, Jacobs left the site to return to Boise. All of the sampling was conducted in accordance with the work plan amendment. No deviations were observed.

Other Notes/Observations:

- **Radiological readings**: As per the work plan addendum, the laboratory requested that the soils be screened for gross radiological concentrations. In order to measure the radiological concentrations, Golder would shoot 3 background readings near the HQ area in native soils using a Ludlum Model 19 Gamma Meter, Serial #308579. To measure the radiological concentrations in the samples prior to shipping, when a DU was completed and the soils were ready for shipping, would shoot each baggie of composited soil sample, and then also shoot the packed cooler that was prepared to be shipped. Jeff Hamilton also discussed with Golder about obtain off-site background radiological readings to ensure they are truly background.
- **Decontamination:** The sampling trowels and measuring cups were decontaminated only between DUs, not between each soil pit, in accordance with the work plan. Between each pit, however, the trowels were inspected to see that no soil from the previous pit remained. The backhoe bucket was not decontaminated, as it was not in contact with the soil being sampled at each increment. Fortunately, at the time of sampling, the soil was very dry and none of it appeared to stick to the trowel or backhoe bucket. However, if soil conditions become moist or wet and sticky, additional decontamination within the DUs may need to be considered.
- **Deviations from the Work Plan**: No sampling deviations from the work plan were observed. However, because the sampling increments were based on a grid system, the coordinates were pulled from the maps, and then the increments laid out on the ground with the pre-loaded GPS points, occasionally there was on an obstacle in either the primary, secondary, or tertiary increment location. Some examples noted include (See Photos):
    - DU-04-6 was located on a slope on the north side of the A-12 Pit and several large, deep, ravines had been eroded into the slope. Sample increments 31 and 32 were located within two of the ravines. Therefore, the sample points were relocated to the west to avoid being in the ravine, and with the secondary sample increment located 2 meters away from the vertical ravine edge.
    - As noted, DU-9b was a long, narrow DU, with the primary points pre-located with the GPS. At some of increment locations, the secondary or tertiary sample was located on a cut or fill slope near the edges of the DU. However, this only occurred in in a few sample locations. This occurred on the east side of DU-A-5 also in a few locations, where the tertiary sample was located on a cut slope.
    - Other examples include small, random variations, such as one of the tertiary pits in DU-9a was on a pile of rocks, and in some instances one of the three soil pits at a given increment within a DU may have soil with a different color and texture.

Hopefully, given the large number of increments in each DU, these minor variations are to be expected and will not affect the overall quality or consistency of the data.

RECOMMENDATIONS

Jacobs provides the following recommendations:

- Because the Jacobs oversight is part-time, we will not be able to observe every sample increment within each and every DU. At the locations we do observe, we record and document as much information on the field sheets and with photographs as possible. However, we may not even be present for sampling a single DU, as these can take two days given the triplicate samples. Therefore we recommend that we plan oversight strategically to be conducted at a

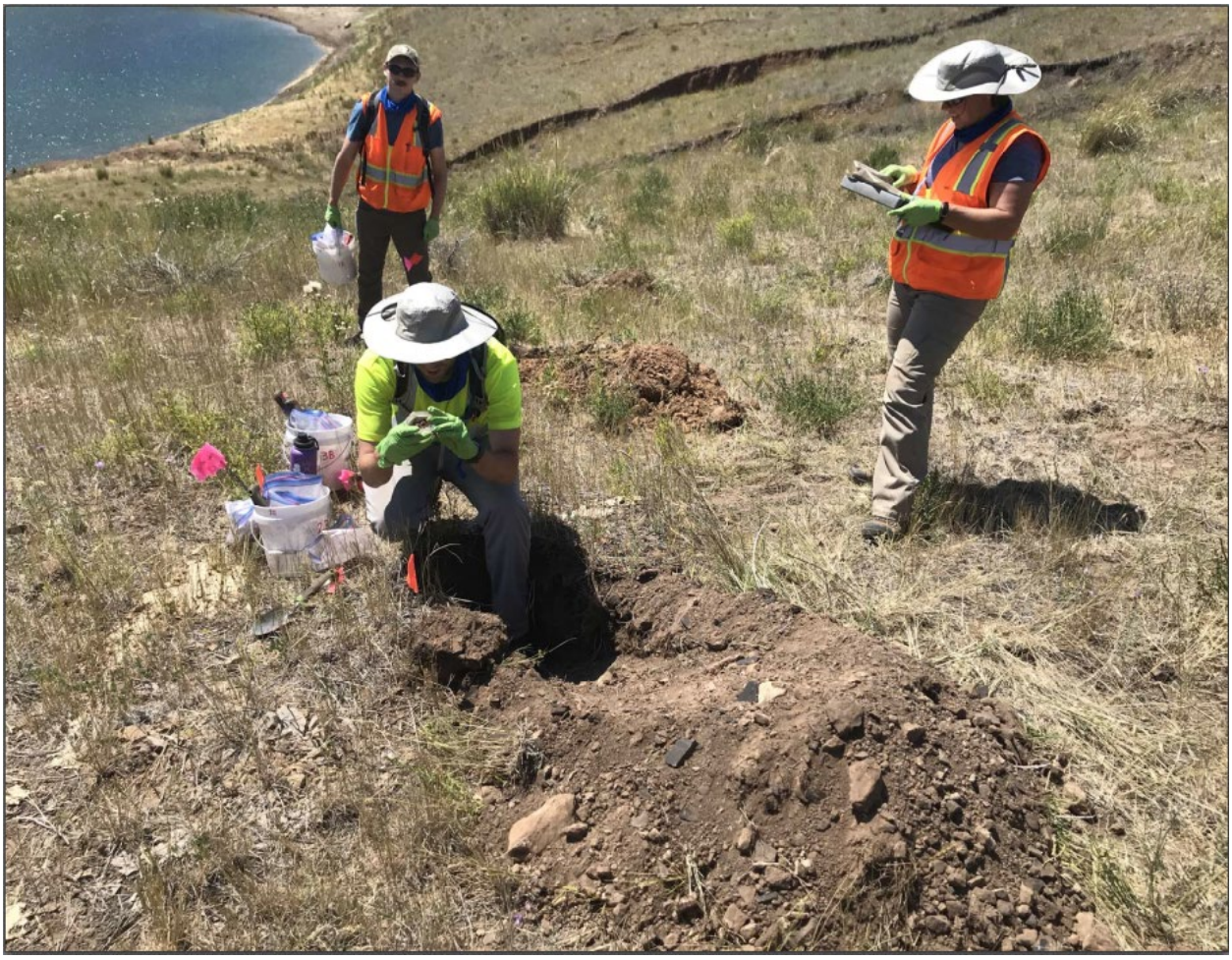
variety of DUs in different parts of the mine site, for example DUs in the North Limb that may be expected to be variable in COCs, and in all parts of the mine including the East Limb, which is very expansive, and the South 40 area, which is a newer portion of the mine site and may be reclaimed differently.

- Strategically conducting oversight at times when the potential for variations in sampling consistency may emerge, such as when Golder changes out crews
- As suggested by Jeff Hamilton, accompany Golder the September surface and groundwater sampling event, in order to provide Jacobs with a better idea of the layout of the mine site and the sampling points.

References

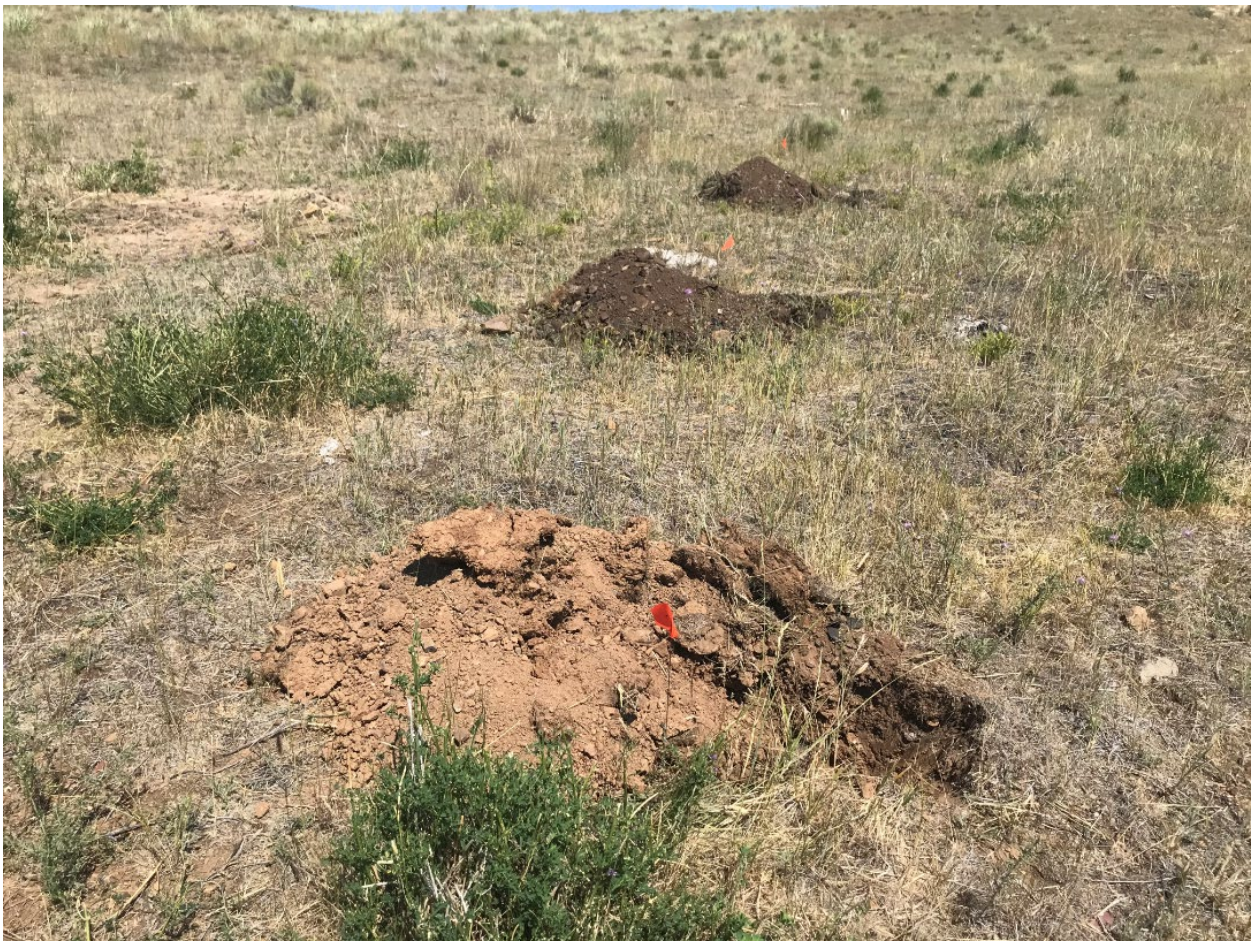
Golder Associates Inc, [Golder], 2020. *2020 Gay Mine Soil Sampling Remedial Investigation Work Plan Addendum*. Submitted to US Environmental Protection Agency. July.

Site Photographs



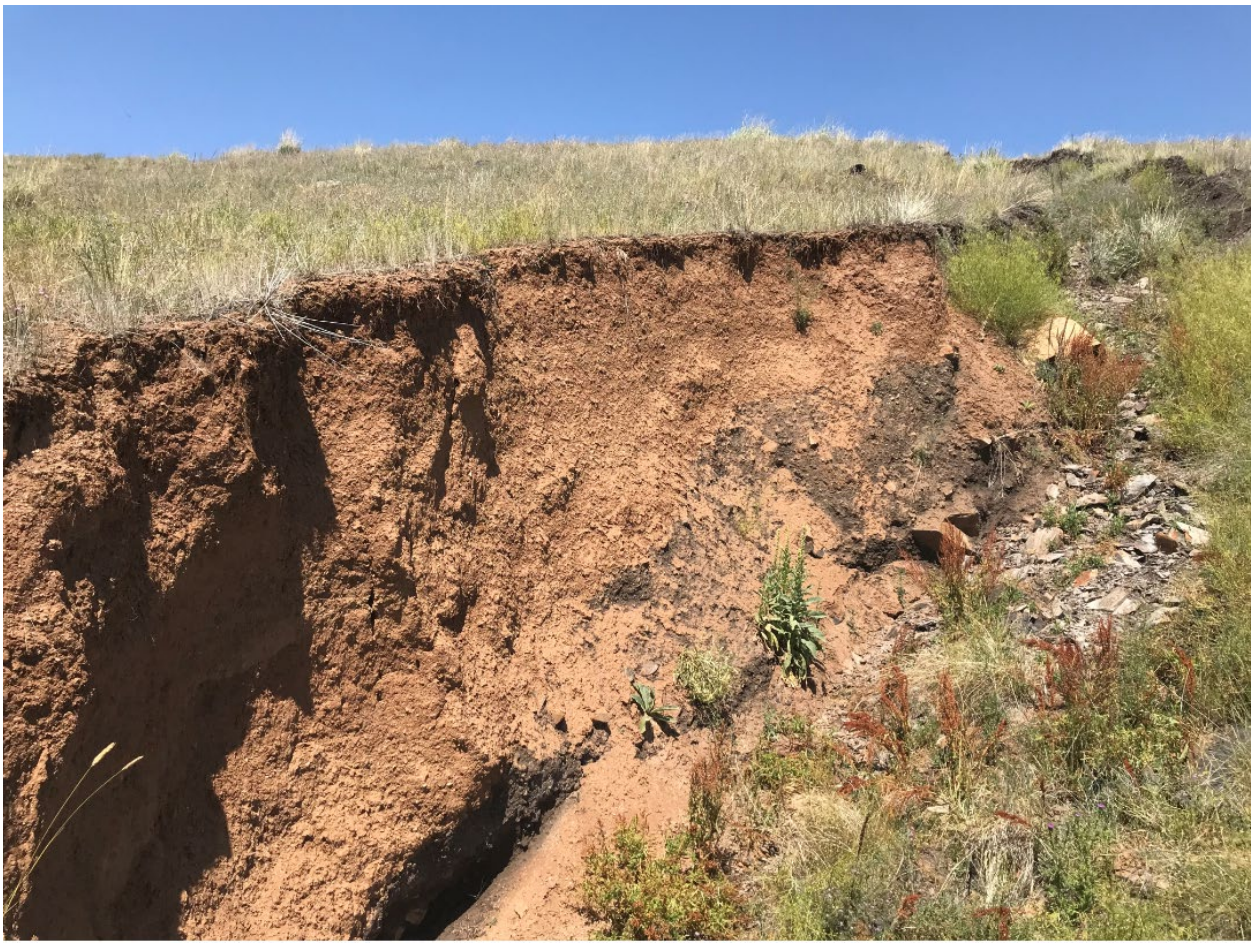
Photograph 1

Golder crew sampling DU-04-6. Note 3 pits at this increment (primary in center, secondary in foreground, tertiary in background), sampling buckets to hold baggies, flagging, and soil scribe.



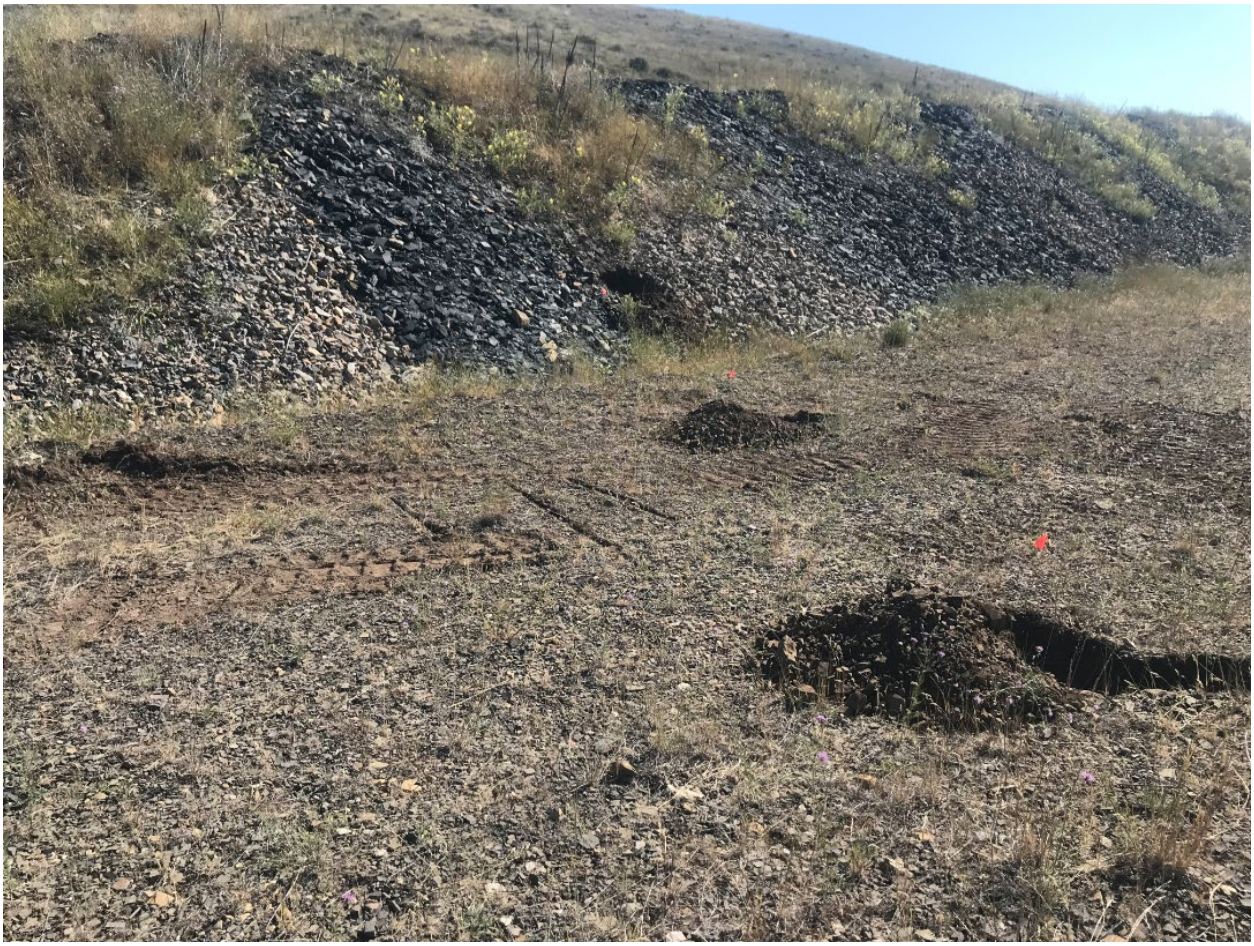
Photograph 2

DU-04-6, looking northeast: Tertiary (foreground), Primary (middle), and Secondary soil increment Pits in. Note the different soil color (Lighter brown) in the Tertiary Pit.



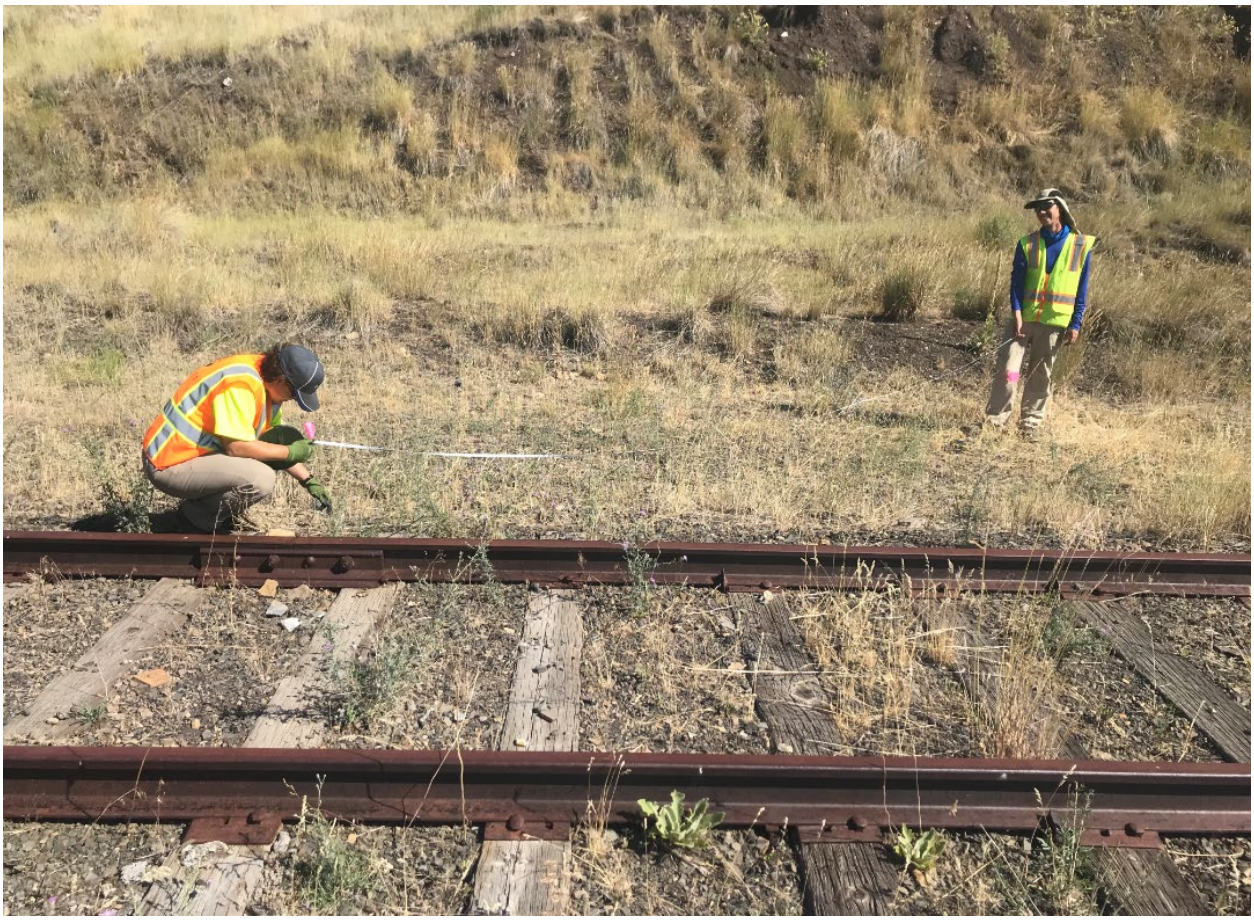
Photograph 3

Ravine/springs in slope in DU-04-6 that necessitated relocating the sample increments in the field.



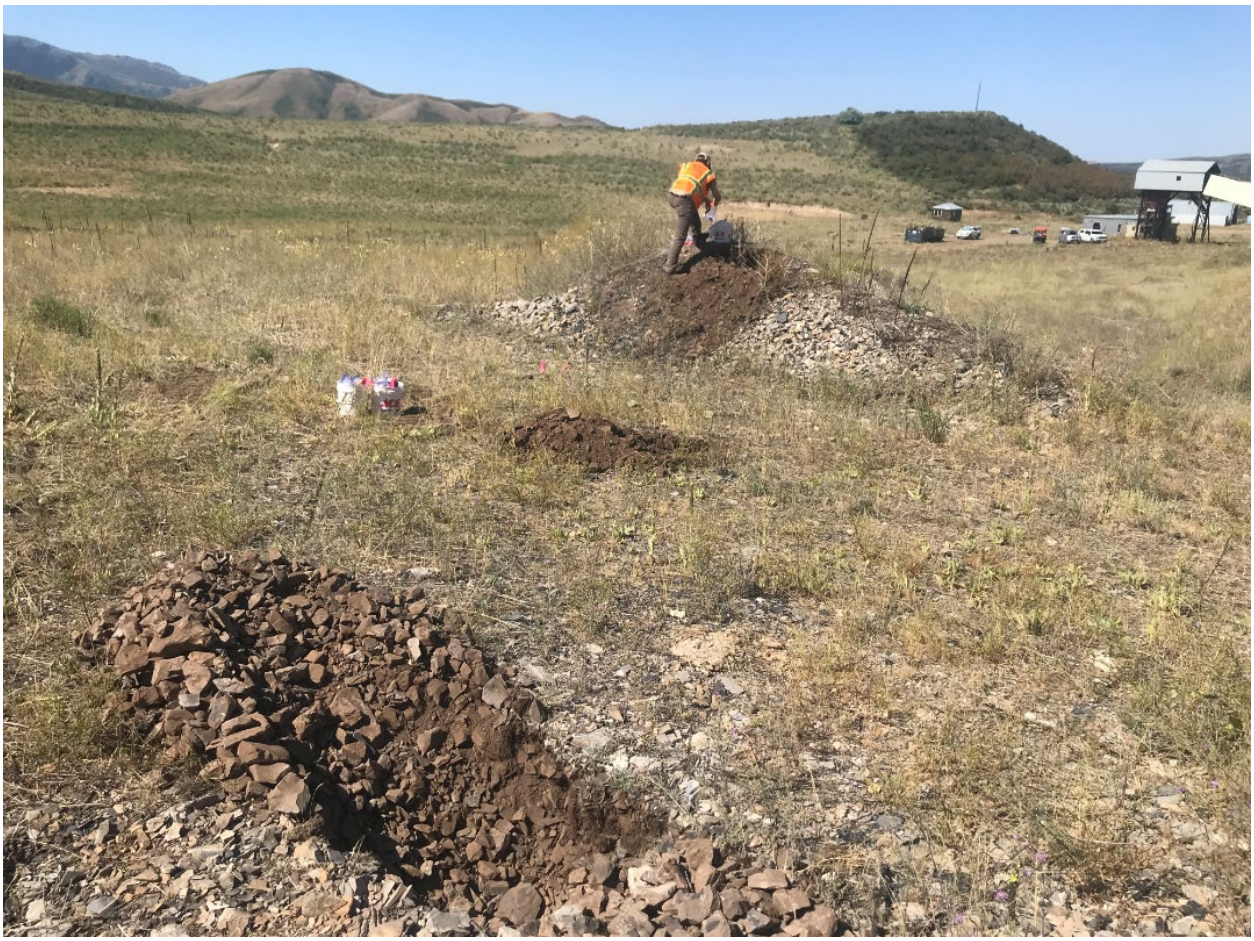
Photograph 4

DU-OT-NL-09b, soil increment pits in railroad ballast. Note that secondary pit is in the slope.



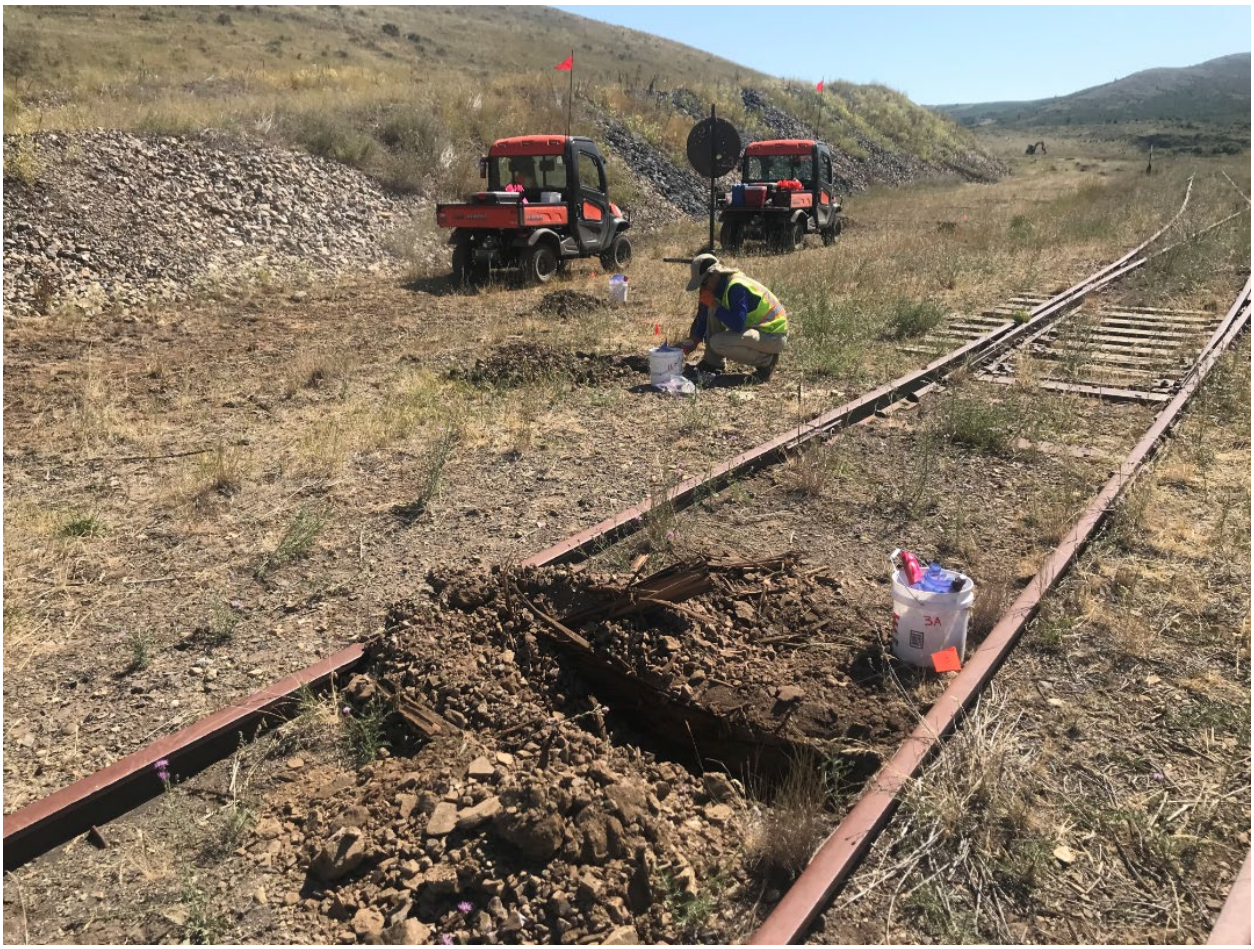
Photograph 5

Golder crew locating soil increments in DU-OT-NL-09b along railroad tracks. Once the primary point was located using the GPS, the secondary and tertiary points were manually measured in the field.



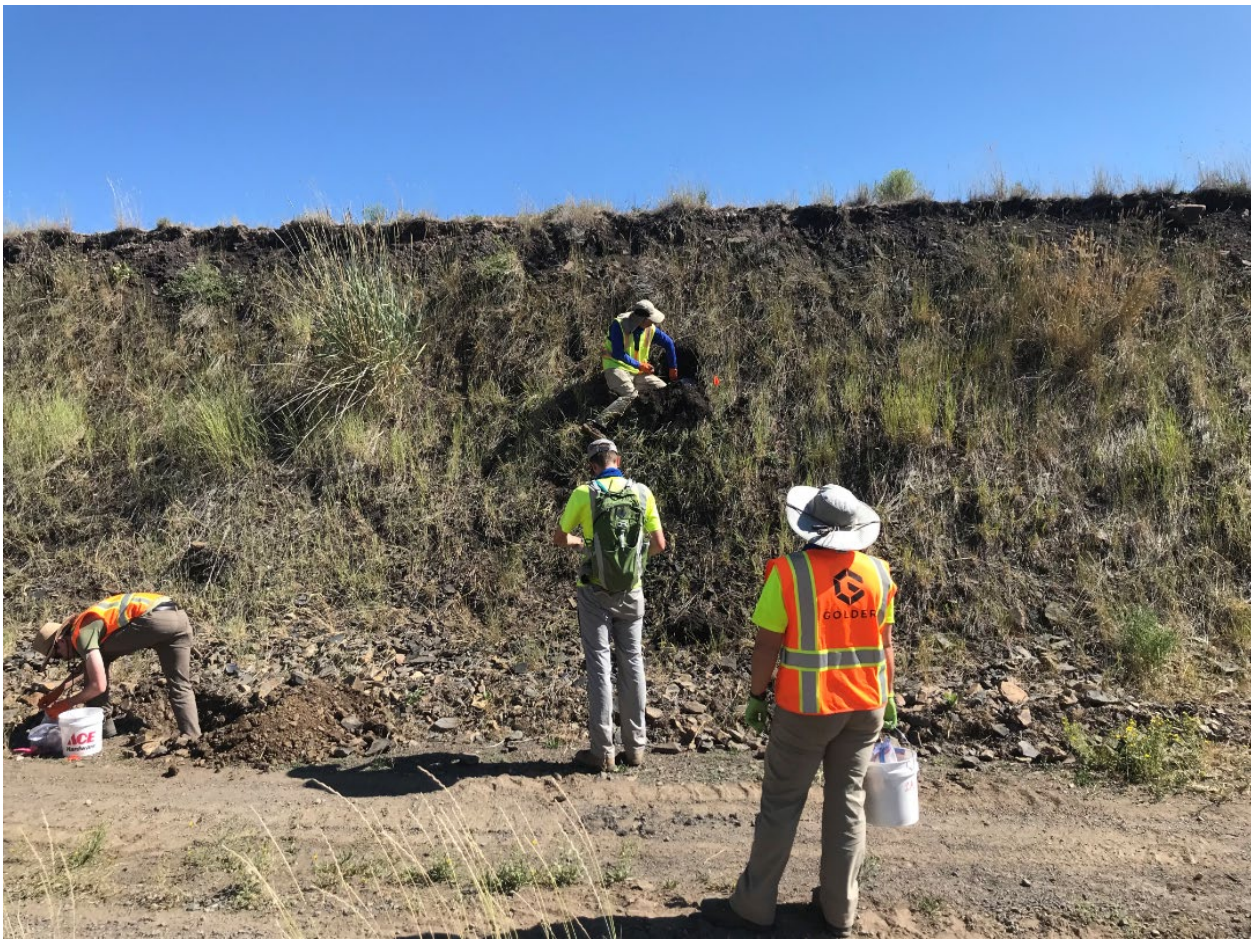
Photograph 6

DU-OT-NL-9a looking southwest: Secondary increment in foreground, Primary increment in center, and Tertiary increment in background on a pile of rocks.



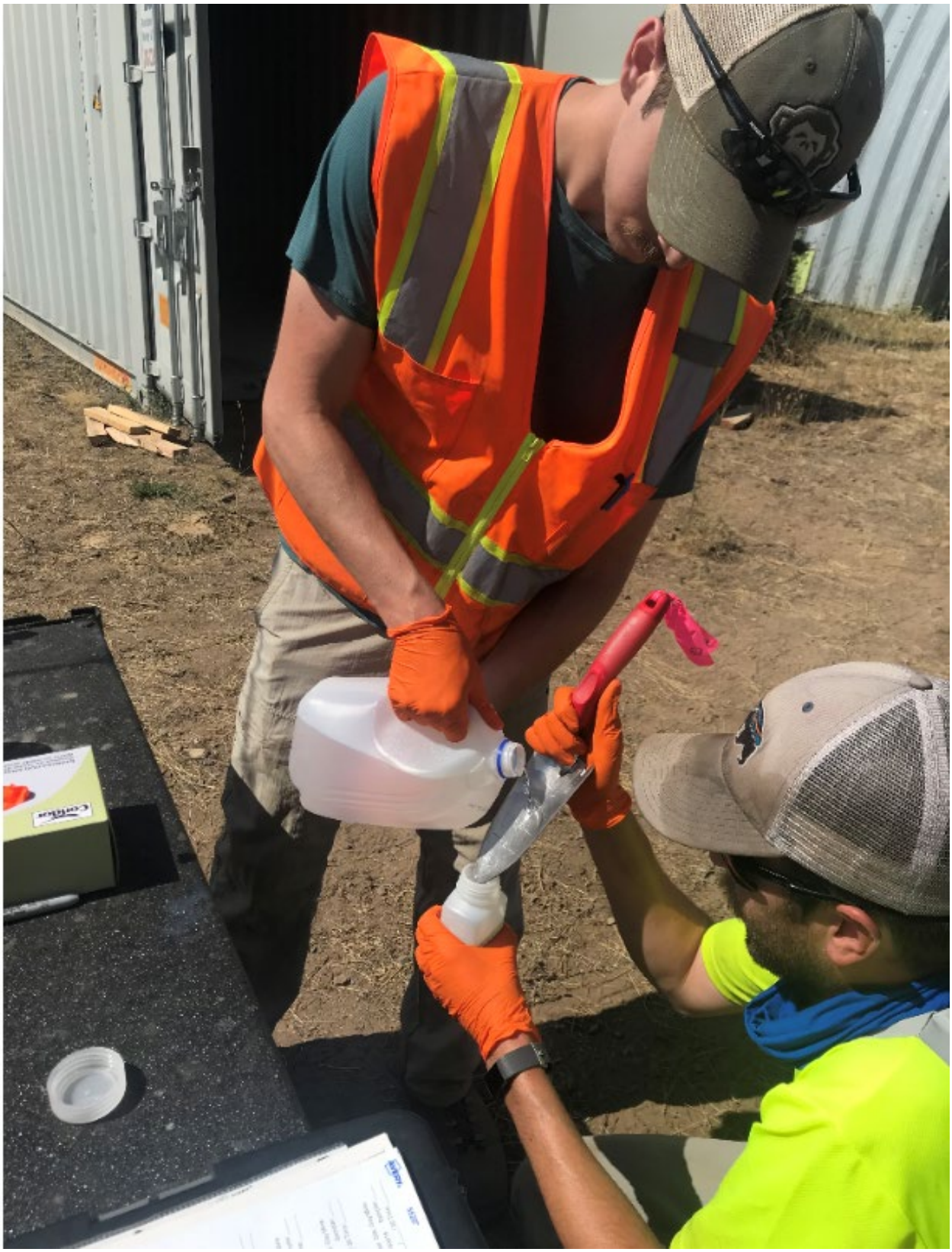
Photograph 7

DU-OT-NL-9b looking northeast: Tertiary increment in foreground (between railroad ties), Primary increment in center being sampled, and Secondary increment in background.



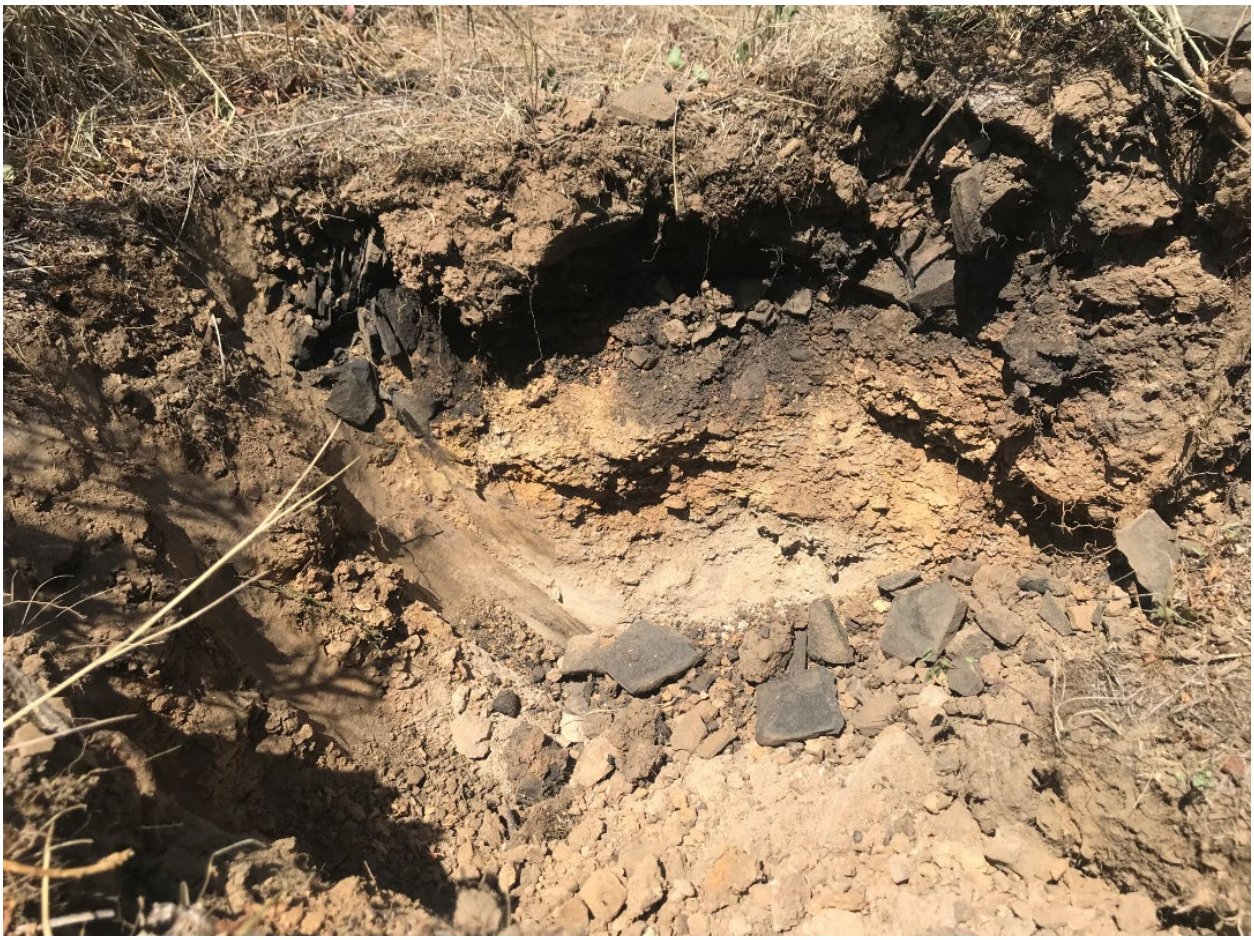
Photograph 8

DU-OT-NL-9b: Because of the gridded, pre-determined locations, some of the sample increments (Tertiary sample in this case) are on the cut slope south side of dirt road.



Photograph 9

Collecting Equipment Blank on trowel. Note red color-coded handle.



Photograph 10

Some remnants of black shale in a pit in DU-A-05. Overall, very little shale was observed in this Mill Shale DU.